CLAIMS

What is claimed is:

1. A method of pressure balancing across a bearing adjacent to a pressure differential, the pressure differential including a first pressure side on a first side of said bearing and a second pressure side on a second side of said bearing, comprising:

providing a bypass port around said bearing for allowing a fluid flow from the first pressure side to the second pressure side.

2. The invention according to claim 1, further comprising providing a valve body including a selectively operable valve for metering a fluid flow, said bearing cooperating with said valve body.

3. The invention according to claim 1, wherein the first pressure side is a high-pressure side.

4. The invention according to claim 1, wherein the second pressure side is a low-pressure side.

5. The invention according to claim 1, further comprising a rotational shaft, said shaft rotationally cooperating with said valve body by way of said bearing.

6. The invention according to claim 5, wherein said bypass port is configured in said shaft and provides a passage around an inner periphery of said bearing.

7. The invention according to claim 5, wherein said passage is milled into said shaft.

8. The invention according to claim 5, wherein said passage is molded into said shaft.

9. The invention according to claim 1, wherein said bypass port is configured in said valve body and provides a passage around an outer periphery of said bearing.

10. The invention according to claim 9, wherein said passage is milled into said valve body.

11. The invention according to claim 9, wherein said passage is molded into said valve body.

12. The invention according to claim 1, wherein said bypass port is configured in said bearing and provides a passage around an outer periphery of said bearing.

13. The invention according to claim 12, wherein said passage is milled into said bearing.

14. The invention according to claim 12, wherein said passage is molded into said bearing.

15. The invention according to claim 1, wherein said bypass port is configured in said bearing and provides a passage around an inner periphery of said bearing.

16. The invention according to claim 15, wherein said passage is milled into said bearing.

17. The invention according to claim 15, wherein said passage is molded into said bearing.

18. The invention according to claim 1, wherein said valve body is a throttle body of a fluid flow metering system of an engine.

19. The invention according to claim 1, wherein said valve body is a throttle body of a vehicle.

20. The invention according to claim 1, wherein said bearing is selected from the group consisting of a ball bearing, needle bearing, bushing, and combinations thereof.

21. A method of pressure balancing across a bearing adjacent to a valve having a high-pressure side on a first side of said bearing and a low-pressure side on a second side of said bearing, comprising:

providing a valve body including a valve on a rotational shaft for metering flow by rotating said shaft with respect to said valve body, said shaft being rotationally connected to said valve body by way of a bearing; and

providing a bypass port between said bearing and said valve body for allowing a flow from said high-pressure side to said low-pressure side.

22. The invention according to claim 21, wherein said bypass port is configured in said valve body and provides a passage around an inner periphery of said bearing.

23. The invention according to claim 22, wherein said passage is milled into said valve body.

24. The invention according to claim 22, wherein said passage is molded into said valve body.

25. The invention according to claim 21, wherein said valve body is a throttle body of a vehicle.

26. The invention according to claim 22, wherein said passage is configured in said outer periphery of said bearing.

27. The invention according to claim 21, wherein said bypass port communicates to the shaft on a first side of said bearing and on a second side of said bearing.

28. The invention according to claim 21, wherein said bypass port is configured to communicate between an intake bore and a throttle control chamber.

29. The invention according to claim 21, wherein said bearing is selected from the group consisting of a ball bearing, needle bearing, bushing, and combinations thereof.

30. A method of pressure balancing across a bearing adjacent to a valve having a high-pressure side on a first side of said bearing and a low-pressure side on a second side of said bearing, comprising:

providing a valve body including a valve on a rotational shaft for metering flow by rotating said shaft with respect to said valve body, said shaft being rotationally connected to said valve body by way of a bearing; and

providing a bypass port between said bearing and said valve body for allowing a flow from said high-pressure side to said low-pressure side;

wherein said bypass port communicates to the shaft on a first side of said bearing and on a second side of said bearing.

31. The invention according to claim 30, wherein said bypass port is configured in said valve body and provides a passage around an inner periphery of said bearing.

32. The invention according to claim 31, wherein said passage is milled into said valve body.

33. The invention according to claim 31, wherein said passage is molded into said valve body.

34. The invention according to claim 31, wherein said passage is configured in said outer periphery of said bearing.

35. The invention according to claim 30, wherein said valve body is a throttle body of a vehicle.

36. The invention according to claim 30, wherein said bypass port is configured to communicate between an intake bore and a throttle control chamber.

37. The invention according to claim 30, wherein said bearing is selected from the group consisting of a ball bearing, needle bearing, bushing, and combinations thereof.

38. A throttle body for an engine, wherein a pressure differential is present in proximity to the throttle body, the pressure differential including a first pressure side and a second pressure side, comprising:

a bearing cooperating with said valve body; and

a bypass port around said bearing for allowing a fluid flow from the first pressure side to the second pressure side.

39. The invention according to claim 38, further comprising a valve body including a selectively operable valve for metering a fluid flow.

40. The invention according to claim 38, wherein the first pressure side is a high-pressure side.

41. The invention according to claim 38, wherein the second pressure side is a low-pressure side.

42. The invention according to claim 38, further comprising a rotational shaft, said shaft rotationally cooperating with said valve body by way of said bearing.

43. The invention according to claim 38, wherein said bypass port is configured in said shaft and provides a passage around an inner periphery of said bearing.

44. The invention according to claim 42, wherein said passage is milled into said shaft.

45. The invention according to claim 42, wherein said passage is molded into said shaft.

46. The invention according to claim 38, wherein said bypass port is configured in said valve body and provides a passage around an outer periphery of said bearing.

47. The invention according to claim 46, wherein said passage is milled into said valve body.

48. The invention according to claim 46, wherein said passage is molded into said valve body.

49. The invention according to claim 38, wherein said bypass port is configured in said bearing and provides a passage around an outer periphery of said bearing.

50. The invention according to claim 49, wherein said passage is milled into said bearing.

51. The invention according to claim 49, wherein said passage is molded into said bearing.

52. The invention according to claim 38, wherein said bypass port is configured in said bearing and provides a passage around an inner periphery of said bearing.

53. The invention according to claim 52, wherein said passage is milled into said bearing.

53. The invention according to claim 52, wherein said passage is molded into said bearing.

55. The invention according to claim 38, wherein said bearing is selected from the group consisting of a ball bearing, needle bearing, bushing, and combinations thereof.

56. A throttle body for an engine, comprising:

a body portion including an air intake portion;

a butterfly valve configured to meter air through said air intake portion;

said butterfly valve attached to a shaft which is configured to rotate said body portion;

said shaft being rotationally coupled with a bearing in said body portion, said bearing being fit into a cavity in said body portion; and

surfaces for forming a port bypassing said bearing between a differential pressure zone.

57. The invention according to claim 56, wherein the differential pressure is defined axially along said shaft.

58. The invention according to claim 56, wherein the differential pressure is between said air intake portion and a control portion of said body portion.

59. The invention according to claim 56, wherein a passage is formed around an outside periphery of said bearing for allowing flow past said bearing in an axial direction of said shaft.

60. The invention according to claim 56, wherein said body portion includes a high-pressure portion on a first side of said body portion and a low-pressure portion on a second side of said body portion in said air intake portion whereby a passage is provided therebetween, wherein said passage communicates with either said high-pressure side or said low-pressure side of said air intake portion.

61. The invention according to claim 56, wherein said bearing is selected from the group consisting of a ball bearing, needle bearing, bushing, and combinations thereof.

62. A throttle body for an engine, comprising:

a body portion including an air intake portion;

a butterfly valve configured to meter air through said air intake portion;

said butterfly valve attached to a shaft which is configured to rotate said body portion;

said shaft being rotationally coupled with a bearing in said body portion, said bearing being fit into a cavity in said body portion; and

surfaces for forming a port bypassing said bearing between a differential pressure zone;

wherein said body portion includes a high-pressure portion on a first side of said body portion and a low-pressure portion on a second side of said body portion in said air intake portion whereby a passage is provided therebetween, wherein said passage communicates with either said high-pressure side or said low-pressure side of said air intake portion.

63. The invention according to claim 62, wherein the differential pressure is defined axially along said shaft.

64. The invention according to claim 62, wherein the differential pressure is between said air intake portion and a control portion of said body portion.

65. The invention according to claim 62, wherein the passage is formed around an outside periphery of said bearing for allowing flow past said bearing in an axial direction of said shaft.

66. The invention according to claim 62, wherein said bearing is selected from the group consisting of a ball bearing, needle bearing, bushing, and combinations thereof.